



Forcible, drug-facilitated, and incapacitated rape in relation to substance use problems: Results from a national sample of college women[☆]

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ABSTRACT

This is the first study to examine the relation between rape and substance use problems in college women as a function of three legally recognized forms of rape: forcible, incapacitated, and substance-facilitated rape. Data were collected via structured telephone interview with a large national sample of college women aged 18–34 years ($n=1980$). Lifetime prevalence of any type of rape was 11.3% in the sample. Prevalence estimates for binge drinking and substance abuse were 15.8% and 19.8%, respectively. Lifetime experience of incapacitated rape and drug–alcohol facilitated rape, but not forcible rape, were associated with increased odds of past-year binge drinking and substance abuse. Findings have implications for secondary prevention and call for continued differentiation in assessment of rape type.

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1. Introduction

A substantial body of research has identified rape as a major risk factor for a wide range of mental health and health-risk problems (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993; Kilpatrick, Acierno, Resnick, Saunderson, & Best, 1997; Kilpatrick & Acierno, 2003; Ullman & Brecklin, 2003). Less is known about how these outcomes differ as a function of forcible vs. substance-facilitated or incapacitated rape. Such knowledge is critical to identification and service provision with college women and other at-risk populations given that there may be major differences in the nature and psychosocial consequences associated with these types of rape. The aim of this study was to examine two health-risk correlates of rape—binge drinking and substance abuse—as a function of three legally recognized forms of rape: rape by use of force or threat of force (forcible rape; FR), rape by means of victim's self-induced intoxication (incapacitated rape; IR), and rape by means of the perpetrator's deliberate intoxication of the victim (drug or alcohol facilitated rape; DAFR). These relations were examined within a national sample of U.S. college women ($n=1980$).

1.1. Rape and substance use

Both longitudinal and cross-sectional research provides support for the relation between rape and substance use. Among a nationally representative sample of 4023 adolescents, those with a history of

sexual assault were nearly five times more likely to endorse substance abuse than those without a sexual assault history (Kilpatrick et al., 2000). Among college women, sexual assault approximately doubled the odds of heavy drinking in the year subsequent to assault (Humphrey & White, 2000). Additionally, adult women sampled in the National Women's Study provided a nationally representative longitudinal perspective, finding that women's odds of developing alcohol abuse doubled following an assault, after controlling for pre-assault alcohol abuse (Kilpatrick et al., 1997). Although these studies provide support for the relation between rape and subsequent alcohol abuse, they do not differentiate between various types of rape experiences (i.e., DAFR, IR, and FR) and do not eliminate pre-existing heavy drinking as a potential explanation for this relation between assault and subsequent heavy drinking.

More recent research suggests that drinking problems subsequent to assault may be more strongly associated with prior levels of drinking than they are with the assault experience. Testa and Livingston (2000) longitudinally sampled (including an initial “time-one” assessment and subsequent assessment at 12 months) a group of high-risk community women and found that subsequent alcohol consumption/alcohol problems were predicted by time-one alcohol consumption, and not by time-one sexual aggression. Because this study was limited by its small sample size and use of only high-risk, moderate to heavy drinkers, Testa and colleagues (2007) replicated their findings with a larger household sample ($n=927$) of community women using a similar longitudinal assessment time-frame of three assessments, each 12 months apart. Findings from their more recent study indicated that whereas there were significant concurrent and prospective bivariate differences between sexual assault victims and non-victims with respect to their heavy episodic drinking, the majority of these differences disappeared after controlling for prior drinking and

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demographic variables. Further, PTSD symptoms at time-two failed to mediate the modest relation found between time-two rape and time-three maximum drinks/occasion. Taken together, these longitudinal data support the notion that pre-rape alcohol use is perhaps the strongest predictor of post-rape levels of alcohol use.

IR experiences, in particular, have been associated with patterns of heavier drinking. Among college women, as many as 72% of rape victims have endorsed IR experiences, with college heavy episodic drinking and high school (prior) heavy drinking being among the strongest predictors of IR (Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004). Kaysen, Neighbors, Martell, Fossos, Larimer (2006) produced the only known study to longitudinally examine alcohol use and alcohol problems as a function of IR experience in college students. In their sample of men and women, they found an overall prevalence of 9% for IR and also found that IR was both concurrently and prospectively associated with an increase in alcohol consumption and the endorsement of negative consequences of alcohol use. Whereas this study was the first to differentiate IR from other forms of rape with respect to alcohol use outcomes, Kaysen et al. (2006) only assessed IR, and was unable to make comparisons between IR, FR, and DAFR.

1.2. Rape tactics

Three studies suggest important differences between FR and IR. Testa et al. (2003) sampled over 1000 community women (aged 18–30) and found little difference in the lifetime prevalence of the two forms of rape (IR=9.4% and FR=9.9%). However, differences did emerge with respect to predictors. Having an older boyfriend, using marijuana, and using hard drugs prior to age 18 were associated with both FR and IR. Alcohol use prior to age 18 was associated only with IR, whereas child sexual abuse was associated only with FR. Further, IR was more likely to occur after a woman had spent time at a bar or party and was less likely to involve a perpetrator with whom the victim had a previous sexual relationship. Abbey, BeShears, Clinton-Sherrod, McAuslan (2004) and Abbey, Zawacki, Buck, Clinton, McAuslan (2004), with a considerably smaller community sample of 272 Caucasian and African American women (aged 18–49), found fewer differences between FR and IR victims' experience with the exception of higher rates of alcohol use involved in IR and higher likelihood of injury and life disruption in FR. Finally, using a nationally representative sample of community women, McCauley et al. (submitted for publication), found that women with a history of IR were more than three times as likely as those without to report past-year binge drinking and substance abuse. Lifetime FR was associated with over 1.5 times increased risk for past-year substance abuse, but was not related to binge drinking outcomes. DAFR was not significantly associated with binge drinking or substance abuse in this sample of community women. These studies depict a lifestyle involving heavier alcohol use among victims as being associated with IR. Although none of these studies may confidently be generalized to college women due to the nature of their samples, these studies do begin to suggest a potentially unique relation between IR/DAFR and alcohol use. Extension of these findings to college is particularly pertinent given that binge drinking continues to be a major public health concern on campuses nationwide (Wechsler et al., 2002).

1.3. Current study

Clearly, FR, IR, and DAFR represent variant tactics of rape that may differentially relate to health-risk outcomes of victims. The current study examined relative risk for past-year binge drinking and substance abuse by rape type (FR, IR, DAFR) using a national sample of women enrolled in U.S. colleges. Given that previous research has found strong support for a link between IR (but not FR) and general drinking behavior, we predicted that IR (and not FR) would be

associated with past-year binge drinking and past-year substance abuse in our sample of college women. Because very little research speaks directly to the relation between DAFR and women's general substance use, we did not have a priori predictions regarding its relation to binge drinking and substance abuse. We included several victimization characteristics in our analyses based on their association with rape tactics as well as their potential to increase risk for negative rape outcomes (Miner, Klotz-Flitter, & Robinson, 2006; Kaltman et al., 2005; Gore-Felton et al., 1999; Lawyer et al., 2006; Testa et al., 2003). This study also has two main methodological advantages that overcome limitations that are prevalent in this body of research. First, we carefully differentiated FR from DAFR and IR. Second, we recruited a national sample of college women, allowing for greater generalizability and a large enough sample to statistically distinguish between rape tactics with respect to outcomes.

2. Method

2.1. Participants

The college sample consisted of 1980 women. The list sample for college women was purchased from the American Student List (ASL). The ASL includes about 6 million students who are attending approximately 1000 U.S. colleges and universities. The sample recruitment list purchased for our study contained about 17,000 respondents randomly selected from the ASL by region of the country. This allowed us to recruit a sample that was similar to the national census representation of college women. Consistent with procedures used by Fisher, Cullen, and Turner (2000) in the National College Women Sexual Victimization (NCWSV) study, the sample was classified into nine regions: New England, Mid Atlantic, East North Central, West North Central, South Atlantic, East South Central, West South Central, Mountain, and Pacific. The sample was then released to be dialed in proportion to the national census representation of college women. This procedure was designed to ensure adequate representation to the U.S. population of college women. There were 253 different schools included in our final sample from 47 different states. All interviews were conducted via telephone by a national surveying firm, SRBI (Schulman, Ronca, Bucuvalas, Incorporated).

2.2. Interview

Women were interviewed using a computer-assisted telephone interviewing (CATI) system. Completed interviews averaged 20 min. Two steps were taken to increase the likelihood that questions could be answered in an open and honest manner with a reasonable degree of privacy. First, the interviewer specifically asked whether the woman was in a situation where she could be assured of privacy and could answer in an open manner. If the woman said that she could not, the interviewer offered to call back at another time when privacy was more likely. Second, the interview schedule was designed primarily with closed-ended questions requiring yes, no, or other one-word answers. Thus, if a respondent could be overheard within the residence, their answers were virtually content free.

2.3. Measures

The survey included assessment of basic demographic information (age, race, ethnicity, income), rape experiences (including FR, IR, and DAFR), mental health histories (including recent symptoms), and rape characteristics (for those endorsing a rape experience).

2.3.1. Rape tactics

We assessed women's most recent/only incident of rape; women with multiple victimization histories were also assessed about their first incident. In both DAFR and IR cases, the victim was unable to consent

Table 1

Bivariate associations between characteristics of the respondents and past-year binge drinking and substance abuse

	College (N=1980)			
	Binge drinking		Substance abuse	
Demographic variable	%	p value [±]	%	p value [±]
Total	15.8		19.8	
Ethnicity		.001		.006
White	18.5		21.4	
Black	3.8		13.0	
Hispanic	11.1		21.4	
Asian	10.4		12.6	
Married		.709		.042
Yes	17.9		7.3	
No	15.7		20.1	
	Binge drinking		Substance abuse	
Age	F(1,1936)=.011, ns		F(1,1978)=6.11, p<.05	

[±]The chi-square test was used for comparisons; P values were two-tailed.

due to incapacitation due to substances (e.g., lack of consciousness, or lack of awareness or ability to control behavior) The key element of IR was that the victim was intoxicated and impaired via voluntary intake of drugs or alcohol. In contrast, the key element of DAFR was that the victim perceived the perpetrator as having deliberately attempted to produce incapacitation by administering drugs or alcohol. Cases were defined as FR if the perpetrator used force or threat of force. Questions were closed-ended and behaviorally specific.

Classification of individuals into rape categories was based on history of experiencing each type of rape tactic. Classification was non-mutually exclusive and based on women's lifetime history of rape experiences. Therefore, women may have been classified as having experiencing more than one rape type. For example, women who reported an experience of forcible rape as their most recent or only rape incident and also reported a "first incident" that met criteria for DAFR were considered to have a lifetime history of both FR and DAFR. Women who reported elements of multiple rape types during the same incident were classified as having experienced each rape type they endorsed for that incident. For example, a notable portion of DAFR and IR cases involved forcible elements (ranging from 38% to 67%), whereas approximately 10–20% of FR cases involved IR/DAFR elements.

2.3.2. Substance use outcomes

Two substance use outcomes were measured in this study: past-year binge drinking and past-year substance abuse. Past-year binge drinking (BD) was defined as consumption of five or more drinks of an alcoholic beverage within a day with at least monthly frequency (at least 12 or more days within the past-year). To assess BD, women were asked to estimate the number of days in the past 12 months that they consumed five or more drinks of alcoholic beverages in a sitting. This definition approximates the NIAAA definition for "binge drinking" (NIAAA, 2004). Past-year substance abuse (SA) was assessed using the substance use module from the National Women's Study interview, approximating the criteria for abuse set forth by the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed; DSM-IV; American Psychiatric Association, 1994, see Kilpatrick et al., 1997). Past-year substance abuse was assessed via a series of inquiries about the frequency of use, age at onset, and presence and frequency of impairing or distressing experiences related to use of alcohol, marijuana, illicit drugs (cocaine, PCP, heroin, inhalants), club drugs (MDMA, GHB, Ketamine, Rohypnol, Methamphetamine, hallucinogens) or non-medical use of prescription drugs that occurred within the past 12 months (see Kilpatrick et al., 2000 for more detail). In order to meet criteria for abuse, women had to endorse at least one of the negative consequences of use assessed by the DSM-IV (e.g., charged with DUI, trouble with employers, etc.) In addition to face validity, previous research supports the construct validity of this measure, with women classified positive for alcohol abuse having significantly higher mean number of days in which five or more alcoholic beverages were

consumed, higher mean number of days in which 12 or more alcoholic beverages were consumed, and higher mean number of days of reported intoxication (Kilpatrick, Acierno, Resnick, Saunders, & Best, 1997).

2.3.3. Rape characteristics

Several rape characteristics were assessed among women endorsing a rape experience. These characteristics included whether they had experienced multiple victimizations, whether they knew the perpetrator, and whether the incident occurred in the past-year. Multiple victimization status was defined by endorsing more than one rape experience (i.e., both a first incident and most recent incident) that may have taken place in childhood, adolescence, or adulthood. Women reporting both a first and most recent rape incident were coded positive for the multiple victimization variable. Relationship to perpetrator was assessed by asking women if they "knew the (perpetrator) fairly well or not." Because some women reported multiple incidents, only data from the most recent/only incident were used to define this variable for the purposes of this study. Finally, women endorsing a rape experience were also asked if their most recent experience occurred in the past 12 months.

3. Results

3.1. Descriptive statistics

Women had a mean age of 19.89 years ($SD=4.25$). Approximately 75% of the women reported Caucasian, non-Hispanic racial/ethnic status; 11% reported being Black, 6% reported being Asian, 6% reported being Hispanic, 1% reported being Native American, and 1% did not report an ethnicity. Only 2.1% of the women were married. Initial chi-square analyses were conducted for each of the demographic variables with respect to binge drinking and substance abuse outcomes (see Table 1). Post hoc chi-square tests were conducted to further delineate significant racial/ethnic groups. All significant demographic variables were included in the first step of the final regression models.

Overall, FR was the most prevalent rape experience (167 cases; 8.4%), followed by IR (82 cases; 4.1%), and finally DAFR (51 cases; 2.6%). Prevalence of any type of rape was 11.3% in the sample. Prevalence estimates for binge drinking and substance abuse were 15.8% and 19.8%, respectively. Among women meeting criteria for substance abuse, prevalence estimates by substance may be found in Table 2. The majority of IR and DAFR incidents involved intoxication by alcohol (76% and 72% respectively). IR and DAFR involving use of drugs only accounted for 3% and 7% respectively of all IR/DAFR cases, whereas a substantial minority of IR and DAFR involved the use of both drugs and alcohol (21% for both). Marijuana use accounted for the majority (73%) of IR and DAFR incidents involving drug use.

3.2. Binge drinking and substance abuse

A series of hierarchical logistic regression analyses were conducted to examine the association between rape experiences and (a) past-year binge drinking and (b) past-year substance abuse. Analyses controlled for significant demographic factors, and used the three rape tactics (FR, IR, DAFR) as predictor variables.

Table 2

Prevalence of any reported use by substance among women meeting criteria for substance abuse (n=396)

Substance	Prevalence of any use	Prevalence of non-experimental use (>4 times)
Alcohol	99.7% (n=395)	*****
Marijuana	45.5% (n=180)	30.6% (n=121)
Illicit drugs	7.6% (n=30)	3.5% (n=14)
Club drugs	10.1% (n=40)	3.3% (n=13)
Non-medical prescription drug use	20.7% (n=82)	9.3% (n=37)

Table 3

Logistic regression analyses predicting odds of past-year binge drinking and substance abuse among college students

Step	Variable	β	Two step model (n=2000)		β	Three step model (n=216)	
			Odds	95% CI		Odds	95% CI
<i>Regression A: past-year binge drinking</i>							
1	Black	-1.12	0.33**	0.15-0.74	-19.97	.000	0.00-
	White	0.65	1.92**	1.27-2.90	0.55	1.72	0.67-4.48
2	FR	0.38	1.46	0.94-2.26	-0.01	1.00	0.49-2.03
	IR	1.12	3.07***	1.81-5.08	1.01	2.75**	1.37-5.53
	DFR	0.86	2.37**	1.24-4.52	0.64	1.89	0.88-4.04
3	Multiple rapes				-0.25	0.78	0.41-1.48
	Past-year				0.67	1.07	0.52-2.22
	Knew perp				0.38	1.46	0.61-3.52
<i>Regression B: past-year substance abuse</i>							
1	Black	-0.48	0.62	0.35-1.09	-1.96	0.14*	0.02-0.83
	White	0.02	1.02	0.68-1.55	0.02	1.02	0.38-2.73
	Asian	-0.55	0.58	0.29-1.14	0.36	1.44	0.21-9.82
	Age	-0.07	0.93**	0.89-0.98	-0.04	0.96	0.89-1.03
2	FR	0.37	1.44	0.95-2.18	-0.29	0.75	0.38-1.47
	IR	1.48	4.37***	2.69-7.13	0.92	2.52**	1.28-4.95
	DFR	1.31	3.71***	2.01-6.85	0.99	2.70**	1.29-5.65
3	Multiple rapes				0.45	1.57	0.84-2.94
	Past-year				0.10	1.10	0.54-2.26
	Knew perp				-0.71	0.49	0.21-1.12

* denotes $p < .05$.

** denotes $p < .01$.

*** denotes $p < .001$.

3.2.1. Predictors of past-year binge drinking

Caucasian college women had higher odds of past-year binge drinking ($OR = 1.92$ vs. non-Caucasian, $p < .01$), whereas African American college women had lower odds ($OR = 0.33$ versus non-African American ethnicity, $p < .01$). IR ($OR = 3.07$ vs. no IR, $p < .001$) and DAFR ($OR = 2.37$ vs. no DAFR, $p < .01$) emerged as significant predictors. Results are presented in Table 2.

3.2.2. Predictors of past-year substance abuse

Younger college women had higher rates of reported substance abuse ($OR = 0.93$ /year increase, $p < .01$). Again, both IR ($OR = 4.37$ vs. no IR, $p < .001$) and DAFR ($OR = 3.71$ vs. no DAFR, $p < .001$) were associated with significantly increased odds of substance abuse. Results are presented in Table 2.

3.3. Supplemental analyses

We also ran a series of logistic regression analyses with a subset of women who reported at least one rape experience, adding rape characteristics as third-step predictor variables. Almost half of the sample reported multiple rapes (45.7%) and the majority reported knowing their perpetrator (84.5%). Approximately one-quarter (24.7%) of the women reported being raped in the past-year. Results are presented, along with aforementioned analyses in Table 2.

IR ($OR = 4.48$ vs. no IR, $p < .01$) and DAFR ($OR = 2.75$ vs. no DAFR, $p < .01$) emerged as the only significant rape type predictors of past-year binge drinking in the final model. IR ($OR = 2.52$ vs. no IR, $p < .01$), DAFR ($OR = 2.70$ vs. no DAFR, $p < .01$), and African-American ethnicity ($OR = 0.14$ versus non-African American ethnicity, $p < .05$) were significantly associated with past-year substance abuse (Table 3).

4. Discussion

4.1. Integration with previous research

The noteworthy prevalence of IR, DAFR, binge drinking, and substance abuse highlights the importance of investigating their relation in college women. Lifetime experience of IR and DAFR both emerged as

consistent predictors of past-year substance abuse and past-year binge drinking. Further, lifetime experience of forcible rape (excluding elements of drug-facilitation or incapacitation) was not associated with past-year substance abuse or past-year binge drinking. These findings help to disentangle the relatively complicated findings on the relation between rape and alcohol outcomes (like binge drinking), by distinguishing between the contributions of three distinct rape tactics. The current study adds to a growing literature that supports the utility of distinguishing between rape tactics/characteristics when examining mental health correlates like substance abuse. Whereas previous research demonstrates a link between rape and substance abuse (Humphrey & White, 2000; Kilpatrick et al., 1997), this study, consistent with findings from a representative community sample, suggests that when FR, the most commonly referenced type of rape, is isolated, it is no longer significantly associated with substance abuse (McCauley et al., submitted for publication).

The present study also lends support to findings that alcohol/drug use at the time of assault may not only have been a risk factor for the rape itself, but also an indicator of women's risk for current/future substance abuse (Testa, Livingston, & Hoffman, 2007; Kilpatrick, et al., 1997). Although our data are cross-sectional in nature and we did not directly measure drinking behaviors prior to assault, by definition women experiencing either IR or DAFR were either drinking heavily of their own volition, or in an environment where alcohol and drugs were present. Because victims of IR and DAFR are more likely to endorse recent substance use problems, their current alcohol and drug use, in combination with their previous rape history, places them at higher risk for subsequent assault via mechanisms such as lower risk perception, less perceived need for resistance, and less behavioral resistance ability (Testa et al., 2006; Parks & Fals-Stewart, 2004; Abbey et al., 2002). Additionally, these women may also experience increased risk conferred by environmental variables associated with a lifestyle that involves binge/heavy drinking and substance use (for a review, see Testa & Parks, 1996). As such, rape risk reduction programming may benefit from assessing women's current drinking behavior and drug use, particularly marijuana use, as well as behaviorally specific assessments of rape history that distinguishes between tactics. This information could then inform the incorporation of targeted, brief, harm-reduction focused interventions to women reporting IR, DAFR, or current heavy drinking/drug use behavior. Existing interventions targeting problem drinking behavior among college students should also consider incorporating psychoeducation on IR/DAFR.

Consistent with previous research, Caucasian women reported higher levels of binge drinking behavior and African American college women reported lower levels of substance abuse (Mohler-Kuo et al., 2004). None of the rape characteristic variables significantly predicted either past-year binge drinking or past-year substance abuse in the current study. The notable lack of variance in distribution of rape characteristics may have contributed to the relative lack of significant findings in exploratory analyses. It is also possible that use of alcohol at time of assault may have been such a strong predictor of future alcohol use that other assault characteristics did not contribute unique predictive value. Further research is needed to replicate and draw further conclusions from these findings.

4.2. Limitations of current study

This study had several limitations. First, all data were collected retrospectively, at one time point, via self-report. No statements can be made regarding the predictive validity beyond that of a statistical nature. Noting that approximately a quarter of all rapes in this sample occurred within the year prior to the interview, the occurrence of FR, DAFR, and IR did not temporally precede the time-frame for reporting the dependent variables in all cases. In addition, due to the large costs associated with conducting large-scale epidemiologic phone surveys, we could not assess for all incidents of rape and are therefore limited to

information on women's first and most recent rape incidents. Also, because no data pertaining to the onset of current level of drinking (or drinking behavior prior to first rape experience) were collected, we are limited in drawing conclusions about the order of onset of rape experiences in relation to binge drinking and/or substance abuse. Future prospective studies should seek to make more definitive statements pertaining to causality.

5. Conclusions

This study makes several important contributions to the extant literature. First, given the nature of the sample, the results of this study have a high degree of generalizability to women in U.S. colleges, a sample at particularly high-risk for both assault and heavy drinking practices. Results further support pre-rape heavy drinking (as specifically implicated by experience of IR) as a stronger predictor of subsequent drinking problems than victimization alone (as implicated by the insignificance of FR). This group of women may be particularly vulnerable to continued use of substances with hazardous outcomes. This population may benefit from integrated intervention programming that addresses both substance abuse (with focus on alcohol abuse and marijuana use) and sexual assault risk. This was also the first study known to the authors to examine the association between rape tactic and substance use outcomes in a national college sample of women. Future research should extend upon recent work by [Testa and colleagues \(2007\)](#) and examine PTSD symptoms and victim–perpetrator relationship as potential mediators between rape tactics (FR, IR, and DAFR) and substance use, as implicated by previous literature ([Stewart, 1996](#); [Epstein et al., 1998](#); [Kilpatrick et al., 2003](#); [Testa, VanZile-Tamsen, & Livingston, 2007](#)). The methodology for the current study did not allow for a direct test of the self-medication hypothesis. Finally, results suggest important differences between FR, IR, and DAFR in terms of drinking outcomes and indicate the need for future research to examine other possible differences in the experiences (e.g., PTSD, depression, physical health) of women with various types of rape histories.

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